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< Infrastructure

# Complete Composite Systems (CCS)

More rail construction projects are turning to the innovative, eco-friendly post mix TECHNO-CRETE® for their foundation material. Here's why...

TECHNO-CRETE® is a hydrophobic polyurethane foam foundation system. Made from a blend of reprocessed oil from the catering industry and sustainably grown rapeseed oil, it is rapidly becoming the prime post mix choice, offering a green and cost-effective alternative to concrete. Its ease of use and minimal bulk-dispensing qualities also ensure faster installation and reduce health and safety concerns.

## How It Works

Available in two packs, part A of TECHNO-CRETE® consists of a blend of recycled organic mineral oils from the catering trade and rapeseed oil, while part B contains isocyanate.

When the two packs of liquid are mixed together and poured into the hole around the post, the liquid blend expands to 20



times its initial volume to create a lightweight, high-density foam. That foam mixture rises to fill the hole and encapsulates the post, becoming a solid mass able to hold the post within ten minutes. Curing time is 24 hours but the post is hard enough to fix to within one hour.

A huge advantage that TECHNO-CRETE® has over cement-based products is its ability to be used in inclement weather. If the ground or air temperature dips below 0 degrees centigrade, the water required to mix the concrete

will freeze, whereas even if temperatures drop below zero, the exothermic reaction of TECHNO-CRETE® still takes place, resulting in no delays regardless of weather conditions.

## Concrete Comparison

Concrete works by virtue of mass of material. In order to fill a typical 300mm diameter x 600mm deep fence post hole, 3 x 20kg bags of concrete post mix plus 20 litres of water would be required. TECHNO-CRETE®, however, uses skin friction

to its advantage and that same post would need just one 1.8kg bag of TECHNO-CRETE® — and no water — to support it.

Looking at the bigger picture, a major project involving 40km of fencing with posts at four-metre centres would require 10,000 holes. Filling those 10,000 holes would use 600,000kg of concrete post mix and some 200,000 litres of water. That's a total of 800 tonnes of material. At 18 tonnes of payload per truck, that's 45 truckloads of material.

But filling those same 10,000 holes over 40km the green way — using TECHNO-CRETE® — would only require 10,000 x 1.8kg bags of TECHNO-CRETE®. That's 18 tonnes of material, requiring just one truckload, resulting in a vast saving on transportation costs throughout the job.

## Environmental Impact

Cement, which makes up approximately a quarter of concrete post mix, is the world's third-largest source of human-generated CO2 emissions. Cement is responsible for 8% of global CO2 emissions, and producing one tonne of cement generates an estimated 1.25 tonnes of CO2. So the 800 tonnes of concrete mix required for the 10,000 holes job referenced above would generate approximately 150 tonnes of CO2.

In contrast, the 18 tonnes of TECHNO-CRETE® required for the same 10,000 holes project would produce 18 tonnes of CO2. That's over 130 tonnes less CO2 emissions generated than when using concrete (equivalent to over 130 return flights from London to New York), not accounting for the additional CO2 emitted whilst

transporting the materials to the site.

## Operator Safety

With fewer tonnes of material to deal with on site, TECHNO-CRETE® reduces manual handling and results in fewer slips and trips, as well as less back damage and muscle fatigue amongst operatives. With fewer health and safety issues on site, injury claims are therefore decreased. In a recent COSHH assessment by a Tier 1 contractor run through market-leading risk management system Sypol, TECHNO-CRETE® was deemed to be harmless when used with standard PPE.

Another key advantage of using TECHNO-CRETE® is, if trackside access is poor, an operative can carry ten bags of TECHNO-CRETE® in a back-pack, effectively allowing them to serve ten posts on their own. Carrying 30 bags of concrete post mix and 200 litres of water would require more labour and increase non-productive costs, as well as heightening the chances of operatives suffering cement burns, one of the highest health and safety issues contractors have.

We are currently exploring the option for customers to have their required TECHNO-CRETE® supplied in bulk 200-litre drums or 1,000 IBCs (intermediate bulk containers). The mixing and dispensing would be undertaken by machine from a van or trailer.

## Who's Using It?

More than 25 companies, including the likes of Network Rail and Siemens, have used TECHNO-CRETE® and are delighted with



the results and savings.

Following a successful trial, a deal has just been struck that will see TECHNO-CRETE® being used for the Transpennine Route Upgrade scheme, which is improving passenger connections between York and Manchester, via Leeds. The TECHNO-CRETE® foundation will support a GRP handrail system, ultimately involving thousands of bags of material.

TECHNO-CRETE® has also been chosen by rail construction and infrastructure experts Cleshar to be the foundation material to support the installation of a demarcation barrier on the Docklands Light Railway network. The sizeable job will result in a root-mounted, high-level barrier running from Shadwell to Bow Church and Limehouse to Tower Gateway, giving passengers a safe trackside evacuation route if they have to leave the train in the event of an emergency.

You can also read about how TECHNO-CRETE® was the ideal option during a recent challenging installation for Siemens on the Northern City Lines re-signalling project at Drayton Park in London [here](#).

See TECHNO-CRETE® in Action

A demonstrative video of TECHNO-CRETE® being mixed and applied is available to [view here](#).

For further information about the product, please visit the [dedicated TECHNO-CRETE® section on our website](#).

In summary, TECHNO-CRETE® is a green alternative to traditional concrete post mix that:

- dramatically reduces the amount of CO2 emitted into the atmosphere compared to concrete
- saves on the cost of transportation and distances travelled compared to concrete
- reduces operator injuries and therefore injury claims, boosting health & safety records
- ensures faster installation times with less possession
- can be used in all weathers, unlike cement-based products that require water — which would freeze in low temperatures — for mixing

For enquiries about TECHNO-CRETE® and how it can be tailored for multiple applications across the railway industry, please contact the technical experts at CCS, the product's exclusive UK distributor:



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TECHNO-CRETE® is developed by [Strucsol](#)

